

Caplus

L13 3145 S (PEM OR (POLYMER ELECTROLYTE MEMBRANE?))
L14 1732 S L13 AND (FUEL CELL?)
L15 2078 S (PEFC OR (POLYMER ELECTROLYTE FUEL CELL?))
L16 3300 S L14 OR L15

FILE 'CAPLUS, WPIDS' ENTERED AT 17:49:09 ON 30 MAY 2003

L17 1 FILE CAPLUS

L18 1 FILE WPIDS

TOTAL FOR ALL FILES

L19 2 S DE19705469/PN

FILE 'CAPLUS' ENTERED AT 17:50:08 ON 30 MAY 2003

L20 781 S L16 AND PLATINUM?

L21 278 S L20 AND NAFION?

L22 0 S L21 AND TERPINEOL?

FILE 'REGISTRY' ENTERED AT 17:54:48 ON 30 MAY 2003

E TERPINEOL/CN

L23 1 S E3

FILE 'CAPLUS' ENTERED AT 17:55:45 ON 30 MAY 2003

L24 5 S L21 AND ((NONPOLAR? OR (NON-POLAR?) OR (NON POLAR?) OR HYDROPHOBIC?)

L25 5 FOCUS L24 1-

L25 ANSWER 1 OF 5 CAPLUS COPYRIGHT 2003 ACS

AN 1999:631497 CAPLUS

DN 131:259912

TI Membrane electrode assembly for **polymer electrolyte membrane fuel cell** and method for its manufacture

IN Zuber, Ralf; Fehl, Knut; Starz, Karl-anton; Stenke, Udo

PA Degussa-Huls A.-G., Germany

SO Eur. Pat. Appl., 13 pp.

CODEN: EPXXDW

DT Patent

LA German

IC ICM H01M008-10

ICS H01M004-92

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 37, 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 945910	A2	19990929	EP 1999-104630	19990309
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	DE 19812592	A1	19991007	DE 1998-19812592	19980323
	US 6309772	B1	20011030	US 1999-274018	19990322
	JP 11329452	A2	19991130	JP 1999-77861	19990323
	BR 9900605	A	20000606	BR 1999-605	19990323
PRAI	DE 1998-19812592	A	19980323		

AB The membrane electrode assembly of the **fuel cell** comprises a **polymer electrolyte membrane** with porous reaction layers contg. catalysts and ionomers on both sides of the membrane. The reaction layer has an inhomogeneous microstructure formed from an ionomer-impregnated and embedded catalyst portion and an ionomer-free catalyst portion in wt. ratio (1-20):1, esp. (3-10):1. The catalyst can be carbon-supported Pt-group metal or alloy particles. The reaction layer has pore vol. 0.7-1.3, esp. 0.8-1.2 mL/g, for pores with diam. 0.03-1 .mu.m, and thickness 5-100, esp. 10-100 .mu.m. The ionomer can be a proton-conducting tetrafluoroethylene-fluorovinylether copolymer contg. acid groups, e.g., **Nafion**.

ST membrane electrode assembly **PEM fuel cell**;
polymer electrolyte membrane fuel cell

IT Carbon black, uses

RL: CAT (Catalyst use); USES (Uses)
(catalyst supports; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT **Platinum-group metals**

RL: CAT (Catalyst use); USES (Uses)
(catalysts; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT Glycols, uses

RL: NUU (Other use, unclassified); USES (Uses)
(ethers, solvents; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT Polyoxyalkylenes, uses

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(fluorine- and sulfo-contg., ionomers, proton-conducting; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT Polyoxyalkylenes, uses

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(fluorine-contg., sulfo-contg., ionomers, proton-conducting; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT Ethers, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (glycol, solvents; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT Fuel cell electrolytes
 (polymer membranes; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT Fuel cells
 (polymer-electrolyte-membrane; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT Fluoropolymers, uses
 Fluoropolymers, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (polyoxyalkylene-, sulfo-contg., ionomers, proton-conducting; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT Ionomers
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (polyoxyalkylenes, fluorine- and sulfo-contg., proton-conducting; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT Fluoropolymers, uses
 Ionomers
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (proton-conducting; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT Alcohols, uses
 Glycols, uses
 Hydrocarbons, uses
 Paraffin oils
 RL: NUU (Other use, unclassified); USES (Uses)
 (solvents; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT Solvents
 (weakly polar; **nonpolar**; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT 7440-05-3, Palladium, uses 7440-06-4, **Platinum**, uses
 7440-16-6, Rhodium, uses
 RL: CAT (Catalyst use); USES (Uses)
 (catalysts; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT 77950-55-1, **Nafion 115**
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (membranes; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT 7439-89-6, Iron, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses
 7440-18-8, Ruthenium, uses 7440-33-7, Tungsten, uses 7440-47-3, Chromium, uses
 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-62-2, Vanadium, uses
 RL: CAT (Catalyst use); USES (Uses)
 (**platinum** group metals alloyed with, catalysts; membrane electrode assembly for **polymer electrolyte membrane fuel cells**)

IT 116-14-3D, Tetrafluoroethylene, fluorovinylether copolymers,

functionalized 57578-63-9D, Perfluorovinylether-tetrafluoroethylene copolymer, functionalized
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(proton-conducting; membrane electrode assembly for polymer electrolyte membrane fuel cells)

IT 56-81-5, 1,2,3-Propanetriol, uses 57-55-6, 1,2-Propanediol, uses 107-41-5, Hexylene glycol 110-38-3, Decanoic acid, ethyl ester 111-82-0, Dodecanoic acid, methyl ester 463-79-6D, Carbonic acid, alkyl esters, uses 25265-71-8, Dipropylene glycol
RL: NUU (Other use, unclassified); USES (Uses)

(solvents; membrane electrode assembly for polymer electrolyte membrane fuel cells)

RN 7440-05-3
RN 7440-06-4
RN 7440-16-6
RN 77950-55-1
RN 7439-89-6
RN 7439-98-7
RN 7440-02-0
RN 7440-18-8
RN 7440-33-7
RN 7440-47-3
RN 7440-48-4
RN 7440-50-8
RN 7440-62-2
RN 116-14-3D
RN 57578-63-9D
RN 56-81-5
RN 57-55-6
RN 107-41-5
RN 110-38-3
RN 111-82-0
RN 463-79-6D
RN 25265-71-8

L25 ANSWER 2 OF 5 CAPLUS COPYRIGHT 2003 ACS

AN 1994:659704 CAPLUS

DN 121:259704

TI Manufacture of solid polymer electrolyte fuel cells

IN Seki, Tsutomu

PA Tokyo Gas Co Ltd, Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M008-02

ICS H01M004-86; H01M004-88; H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06203849	A2	19940722	JP 1992-358059	19921225
JP 1992-358059		19921225		

AB The fuel cells are prepd. by mixing carbon black loaded Pt catalyst and a ion exchanger resin used as solid polymer electrolyte in a solvent to form a suspension, depositing the suspension on hydrophobically treated substrates to form electrode sheets, holding an ion exchanger polymer electrolyte membrane between an electrode sheet pair, and hot pressing.

ST solid polymer electrolyte fuel cell

✓? what is the solvent?

; polymer electrolyte fuel cell
manuf

IT Fuel cells
(manuf. of solid polymer electrolyte fuel
cells)

IT Carbon black, uses
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(manuf. of solid polymer electrolyte fuel
cells)

IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(manuf. of solid polymer electrolyte fuel
cells)

IT 66796-30-3, Nafion 117
RL: DEV (Device component use); TEM (Technical or engineered material
use); USES (Uses)
(manuf. of solid polymer electrolyte fuel
cells)

RN 7440-06-4
RN 66796-30-3

L25 ANSWER 3 OF 5 CAPLUS COPYRIGHT 2003 ACS
AN 1994:659705 CAPLUS
DN 121:259705
TI Manufacture of solid polymer electrolyte fuel
cells
IN Seki, Tsutomu
PA Tokyo Gas Co Ltd, Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-02
ICS H01M004-86; H01M004-88; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 06203848	A2	19940722	JP 1992-358058	19921225
PRAI	JP 1992-358058		19921225		

AB The fuel cells are prep'd. by mixing carbon black loaded Pt catalyst and a
ion exchanger resin used as solid polymer electrolyte in a solvent
to form a slurry, applying the slurry to a hydrophobically
treated electrode substrate, removing the solvent by evapn. to
form an electrode sheet, and hot pressing an ion exchanger membrane
between a pair of the electrode sheets.

ST solid polymer electrolyte fuel cell
; polymer electrolyte fuel cell
manuf

IT Fuel cells
(manuf. of solid polymer electrolyte fuel
cells)

IT Carbon black, uses
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(manuf. of solid polymer electrolyte fuel
cells)

IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(manuf. of solid polymer electrolyte fuel
cells)

IT 66796-30-3, Nafion 117
RL: DEV (Device component use); TEM (Technical or engineered material
use); USES (Uses)

(manuf. of solid polymer electrolyte fuel
cells)

RN 7440-06-4
RN 66796-30-3

L25 ANSWER 4 OF 5 CAPLUS COPYRIGHT 2003 ACS
AN 1996:388536 CAPLUS
DN 125:38070
TI Manufacture of electrodes for solid polymer electrolyte
fuel cells
IN Tada, Tomoyuki
PA Tanaka Precious Metal Ind, Japan; Watanabe Masahiro; Suttonharuto
Asosheetsu Inc
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-88
ICS B01J037-00; B01J037-02; H01M004-86; H01M008-02; H01M008-10
ICA B01J023-42
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08115726	A2	19960507	JP 1994-277108	19941017
	US 5843519	A	19981201	US 1995-543632	19951016
PRAI	JP 1994-277108		19941017		
	JP 1994-332291		19941017		
	JP 1994-289288		19941028		
	JP 1994-289289		19941028		
AB	The electrodes are prep'd. by spray drying a dispersion of ground catalyst particles in an org. solvent, contg. ion exchanger resin and optionally a hydrophobic resin, to obtain resin coated catalyst granules and applying the granules on a substrate to form a catalyst layer. Preferably, the ground catalyst particles have diam. 0.1-10 .mu.m, the granules have diam. 1-50 .mu.m, the dispersion contains 0.5-15% solids, the spraying is carried out at 90-160.degree. and 0.8-1.5 kg/cm2 spraying pressure, and the solvent has b. .ltoreq.160.degree..				
ST	solid polymer electrolyte fuel cell				
	electrode; fuel cell electrode catalyst resin coating; electrode catalyst ion exchanger coating; hydrophobic resin coating electrode catalyst				
IT	Polyoxyalkylenes, uses				
	RL: NUU (Other use, unclassified); USES (Uses)				
	(fluorine- and sulfo-contg., ionomers, manuf. of Nafion coated catalyst granules contg. platinum loaded on carbon support for solid polymer electrolyte fuel cell electrodes)				
IT	Electrodes				
	(fuel-cell, manuf. of Nafion coated catalyst granules contg. platinum loaded on carbon support for solid polymer electrolyte fuel cell electrodes)				
IT	Fluoropolymers				
	RL: NUU (Other use, unclassified); USES (Uses)				
	(polyoxyalkylene-, sulfo-contg., ionomers, manuf. of Nafion coated catalyst granules contg. platinum loaded on carbon support for solid polymer electrolyte fuel cell electrodes)				
IT	Ionomers				
	RL: NUU (Other use, unclassified); USES (Uses)				
	(polyoxyalkylenes, fluorine- and sulfo-contg., manuf. of Nafion coated catalyst granules contg. platinum loaded on carbon support for solid polymer electrolyte fuel cell electrodes)				

IT Drying
 (spray, spray drying in manuf. of **Nafion** coated catalyst granules contg. **platinum** loaded on carbon support for solid **polymer electrolyte fuel cell** electrodes)
 IT 7440-06-4, **Platinum**, uses 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process);
 PROC (Process); USES (Uses)
 (manuf. of **Nafion** coated catalyst granules contg. **platinum** loaded on carbon support for solid **polymer electrolyte fuel cell** electrodes)
 RN 7440-06-4
 RN 7440-44-0

L25 ANSWER 5 OF 5 CAPLUS COPYRIGHT 2003 ACS
 AN 1999:392852 CAPLUS
 DN 131:33839
 TI Fuel cell electrodes and their manufacture
 IN Yamada, Hiroshi
 PA Tokyo Gas Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01M004-86
 ICS H01M004-88; H01M008-10
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11167925	A2	19990622	JP 1997-365849	19971222
JP 1997-284428		19971001		

AB The electrodes have a catalyst layer, formed on a porous gas diffusion layer, and are prep'd. by evapg. a **solvent** from a suspension contg. catalyst particles, an electrolyte, and a **hydrophobic** agent under controlled temp. and pressure to maintain an evapn. rate of .apprx.8 cm3/min. The catalyst is preferably Pt, Pd, and/or their alloy loaded on C particles; the electrolyte is a perfluorocarbon sulfonic acid; the **hydrophobic** agent is polytetrafluoroethylene; the **solvent** is water and/or alc.; and the fuel cells are **polymer electrolyte fuel cells**.
 ST fuel cell electrode catalyst layer manuf; evapn control fuel cell electrode manuf
 IT Evaporation
 Fuel cell electrodes
 (controlled evapn. of solvents in manuf. of catalyst layers for **polymer electrolyte fuel cell** electrodes)
 IT Carbon black, uses
 RL: CAT (Catalyst use); USES (Uses)
 (controlled evapn. of solvents in manuf. of catalyst layers for **polymer electrolyte fuel cell** electrodes)
 IT Fluoropolymers, uses
 RL: DEV (Device component use); USES (Uses)
 (controlled evapn. of solvents in manuf. of catalyst layers for **polymer electrolyte fuel cell** electrodes)
 IT 7440-06-4, **Platinum**, uses
 RL: CAT (Catalyst use); USES (Uses)
 (controlled evapn. of solvents in manuf. of catalyst layers for **polymer electrolyte fuel cell** electrodes)

IT 9002-84-0, Polytetrafluoroethylene 66796-30-3, Nafion 117
RL: DEV (Device component use); USES (Uses)
(controlled evapn. of solvents in manuf. of catalyst layers for
polymer electrolyte fuel cell
electrodes)
IT 64-17-5, Ethanol, processes 7732-18-5, Water, processes
RL: REM (Removal or disposal); PROC (Process)
(controlled evapn. of solvents in manuf. of catalyst layers for
polymer electrolyte fuel cell
electrodes)
RN 7440-06-4
RN 9002-84-0
RN 66796-30-3
RN 64-17-5
RN 7732-18-5

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